

16. The method of claim 15 further comprising directly measuring atomic H or atomic D separately from the diatomic H₂.

17. The method of claim 15 further comprising differentiating H from D on the basis of said current, an unique chemicurrent being associated with a type of surface reaction.

18. A method associated with chemisorption of a reactant on a ultrathin transition metal film comprising:

providing said ultrathin transition metal film deposited onto a silicon surface in a Schottky diode detector;

generating an incident stream of said reactant; and

generating a current associated with said incident stream on said ultrathin films so that a chemicurrent results from chemisorption of induced excited charge carriers which traverse a Schottky barrier in said Schottky diode detector.

19. The apparatus of claim 1 further comprising a catalytic layer disposed on top of said ultrathin metal film layer which is disposed on said silicon substrate, said catalytic layer being chosen specifically to catalyze a selected reaction which then directly interacts with said ultrathin metal film to create a measurable chemicurrent, said apparatus being defined as a catalytic sensor.

20. The apparatus of claim 19 wherein said catalytic layer catalyzes reactions which include at least one of the group, CO+O₂, CO+NO, and H₂+O₂.

21. The apparatus of claim 19 further comprising a plurality of catalytic sensors combined in an array, an x and y-addressing circuit and a current detector, each one of which plurality of sensors having a different catalytic layer to detect a corresponding plurality of different adsorbates through said x and y-addressing circuits and said current detector.

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